What is claimed is:

Sub A1

1. A multiplex system of tributary signals including a transmitter for multiplexing a plurality of tributary signals supplied from a plurality of upstream signal paths onto a multiplex signal to be transmitted at every fixed interval, a receiver for demultiplexing the multiplex signal received onto a plurality of tributary signals to be supplied to a plurality of downstream signal paths, and a main signal path for transmitting the multiplex signal from the transmitter to the receiver,

said transmitter comprising:

a plurality of transmission side tributary circuits installed as many as the number of the upstream signal paths for assigning to individual tributary signals frame information and different identification codes, the frame information indicating a unit of the tributary signals in the multiplex signal, and the different identification codes being associated with the upstream signal paths, respectively; and

a multiplexer for multiplexing outputs of said plurality of transmission side tributary circuits onto the multiplex signal to be supplied to the main signal path at every fixed interval, and

said receiver comprising:

a demultiplexer for demultiplexing the multiplex signal onto a same number of tributary signals as the tributary signals multiplexed;

a plurality of receiving side tributary circuits installed as many as the number of tributary signals multiplexed onto multiplex signal for supplying the

downstream transmission paths with the tributary signals output from said demultiplexer, at least one of said plurality of receiving side tributary circuits detecting its frame information and making a decision of its identification code in response to the frame information detected; and

a distribution circuit installed between said demultiplexer and said receiving side tributary circuits for carry out switching of output destinations of the tributary signals supplied from said demultiplexer, the switching being implemented for the each unit of the tributary signals in the multiplex signal in response to a decision result of said at least one of said plurality of receiving side tributary circuits.

2. The multiplex system of tributary signals according to claim 1, wherein said multiplexer outputs the plurality of tributary signals supplied from said plurality of transmission side tributary circuits in a predetermined order, and said distribution circuit carries out shifting and switching of the output destinations of the tributary signals to said receiving side tributary circuits with maintaining its demultiplexing order.

3. The multiplex system of tributary signals according to claim 1, wherein said at least one of said plurality of receiving side tributary circuits for deciding the identification code comprises a code extraction circuit for extracting the identification code from at least one of the tributary signals, and a code identity detection

circuit for comparing the identification code extracted by said code extraction circuit with a common identification code to output a match/mismatch decision result, and wherein said distribution circuit carries out switching of the output destinations of the tributary signals in response to the match/mismatch decision result.

4. The multiplex system of tributary signals according to claim 1, wherein said at least one of said plurality of receiving side tributary circuits for deciding the identification code comprises a code extraction circuit for extracting the identification code from at least one of the tributary signals, and wherein said distribution circuit compares the identification code extracted with the identification code of said at least one of said plurality of receiving side tributary circuits, and carries out switching of the output destinations of the tributary signals in response to a difference between the two identification codes compared.

5. The multiplex system of tributary signals according to claim 1, wherein said at least one of said plurality of receiving side tributary circuits for deciding the identification code comprises a code extraction circuit for extracting the identification code from at least one of the tributary signals, and a code phase difference decision circuit for comparing the identification code extracted by said code extraction circuit with a predetermined identification code assigned to said at least one of said plurality of receiving side tributary

circuits to output a difference as a decision result, and wherein said distribution circuit carries out switching of the output destinations of the tributary signals in response to the difference.

6. The multiplex system of tributary signals according to claim 5, wherein said code phase difference decision circuit comprises a plurality of code identity detection circuits for comparing the extracted identification code with all identification codes associated with the downstream signal paths, and a collection circuit for acquiring phase differences of the tributary signals in a multiplexed order in response to outputs of said plurality of code identity detection circuits and the multiplexed order of the tributary signals.

7. The multiplex system of tributary signals according to claim 5, wherein said code extraction circuit outputs an extraction invalid signal when it cannot identify the frame information in the tributary signal supplied from said distribution circuit, and wherein said distribution circuit carries out switching disregarding a decision result of the identification code by the receiving side tributary circuit that outputs the extraction invalid signal.

8. The multiplex system of tributary signals according to claim 5, wherein said plurality of transmission side tributary circuits each comprise a circuit for adding besides the identification code and frame information one

of an error detecting code and an error correcting code of the identification code, and wherein said code extraction circuit further comprises an error detecting circuit for outputting an invalid signal when it detects an error in the identification code using one of the error detecting code and error correcting code, and wherein said distribution circuit carries out switching disregarding a decision result of the identification code by the receiving side tributary circuit that outputs the invalid signal.

9. The multiplex system of tributary signals according to claim 8, wherein said code extraction circuit outputs instead of the extracted identification code a masking code, which is not assigned as any of the predetermined identification codes, as the invalid signal when the extracted identification code includes an error.

10. The multiplex system of tributary signals according to claim 8, wherein said code extraction circuit further comprises an error correcting circuit for correcting the extracted identification code in response to the error correcting code to output the extracted identification code passing through the error correction as the extracted identification code.

11. The multiplex system of tributary signals according to claim 8, wherein said code extraction circuit outputs an extraction invalid signal as the invalid signal when it cannot correct the identification code in response to

the error correcting code, and wherein said distribution circuit carries out switching disregarding a decision result of the extracted identification code by the receiving side tributary circuit that outputs the extraction invalid signal.

12. The multiplex system of tributary signals according to claim 2, wherein said distribution circuit, which switches the output destinations of the tributary signals in response to a plurality of decision results by said receiving side tributary circuits, comprises a phase difference detection circuit for generating a plurality of shift amounts from the decision results; a phase difference decision circuit for selecting a most likely shift amount among the plurality of shift amounts; and a switching circuit for carrying out shifting and switching by the most likely shift amount selected.

13. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit halts the switching when the most likely shift amount is not unique.

14. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit halts its switching unless the plurality of shift amounts that agree with each other hold a majority.

15. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit halts its switching unless all the plurality of shift amounts agree

with each other.

16. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit selects the shift amount excluding a shift amount associated with an extraction invalid signal.

17. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit halts its switching when extraction invalid signals hold a majority.

18. The multiplex system of tributary signals according to claim 12, wherein said distribution circuit halts its switching when at least one extraction invalid signal is present.

19. A multiplex transmission method of tributary signals comprising the steps of:

adding at a transmitting side frame information and different identification codes to tributary signals supplied from a plurality of upstream signal paths, the frame information indicating a unit of the tributary signals to be transmitted, and the identification codes being different for the upstream signal paths;

multiplexing at the transmitting side the tributary signals passing through the step of adding onto a multiplex signal to be transmitted;

demultiplexing at a receiving side the multiplex signal onto a plurality of tributary signals by using the frame information; and

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deciding in response to the identification codes downstream signal paths to which the tributary signals are supplied.